

**FACT SHEET FOR NPDES PERMIT WA-003093-7**  
**DUWAMISH SHIPYARD, Inc.**

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## INTRODUCTION

The Federal Clean Water Act (FCWA, 1972, and later modifications, 1977, 1981, and 1987) established water quality goals for the navigable (surface) waters of the United States. One of the mechanisms for achieving the goals of the Clean Water Act is the National Pollutant Discharge Elimination System of permits (NPDES permits), which is administered by the Environmental Protection Agency (EPA). The EPA has authorized the State of Washington to administer the NPDES permit program. Chapter 90.48 RCW defines the Department of Ecology's authority and obligations in administering the Wastewater Discharge Permit Program.

The regulations adopted by the State include procedures for issuing permits (Chapter 173-220 WAC), water quality criteria for surface and ground waters (Chapters 173-201A and 200 WAC), and sediment management standards (Chapter 173-204 WAC). These regulations require that a permit be issued before discharge of wastewater to waters of the state is allowed. The regulations also establish the basis for effluent limitations and other requirements which are to be included in the permit. One of the requirements (WAC 173-220-060) for issuing a permit under the NPDES permit program is the preparation of a draft permit and an accompanying fact sheet. Public notice of the availability of the draft permit is required at least thirty (30) days before the permit is issued (WAC 173-220-050). The fact sheet and draft permit are available for review (see [Appendix A—Public Involvement](#) of the fact sheet for more detail on the public notice procedures).

The fact sheet and draft permit have been reviewed by the Permittee. Errors and omissions identified in this review have been corrected before going to public notice. After the public comment period has closed, the Department will summarize the substantive comments and the response to each comment. The summary and response to comments will become part of the file on the permit and parties submitting comments will receive a copy of the Department's response. Comments and the resultant changes to the permit will be summarized in [Appendix E—Response to Comments](#).

GENERAL INFORMATION	
Applicant	Duwamish Shipyard, Inc..
Facility Name and Address	5658 West Marginal Way SW Seattle, WA 98106
Type of Facility	Ship Building and Repairing
SIC Code	3731
Discharge Location	Waterbody name: Duwamish River, River Mile 2.5 Latitude: 47° 33' 03" N Longitude: 122° 20' 22" W
Water Body ID Number	WA-09-1010

## BACKGROUND INFORMATION

### DESCRIPTION OF THE FACILITY

Duwamish Shipyard, Inc., is a ship repair facility located at mile point 2.5 on the west shore of the Duwamish River in Seattle, Washington (Figure 1).

Services are provided to approximately 60 vessels a year, consisting of tug boats, barges, fishing vessels, passenger ferries, and some pleasure craft. The hulls of these vessels are generally constructed of steel, aluminum, and infrequently fiberglass. Ship repair services include electrical and machine work, carpentry, steel fabrication, pipe-fitting, painting, sand blasting, and pressure washing. Haul out facilities include two steel drydocks and a graving dock. Figure 2 shows the site layout.

There are two steel drydocks along the shoreline, oriented generally in a north-south direction. Both drydocks have been updated to provide containment for pressure wash wastewater. Wastewater flows to one end of the drydock, where it is captured in a collection sump and pumped onshore to a pretreatment system prior to discharge to the King County sanitary sewer.

Capacity of Drydocks and Graving Dock			
Operation	Tonnage Tons	Length Feet	Width Feet
Drydock No. 1	750	158	56
Drydock No. 3	1,000	160	64
Graving Dock	N/A	410	138

The graving dock is 410 feet long and 138 feet wide. Repairs in the graving dock take place below the surface level of the river. Vessels are floated into the dock, then the tide gates are shut and the water is pumped out to create a dry work environment. The tide gates leak, so pumps run continuously to keep the floor of the dock dry. Duwamish Shipyard has installed a containment system to separate pressure wash water from the water that seeps in the gate.

The yard is almost completely paved except for a small portion of the craneway located south of the graving dock. Runoff from the paved area discharges to the river via Outfall 005, located at the terminus of the marine railway. The pavement is alternately swept and vacuumed every week. A bobcat loader with a sweeper attachment is used for additional site cleaning.

The catch basins that receive the largest volume of runoff have been fitted with catch basin inserts and oil sorbent pillows. The catch basins are cleaned out on a monthly basis and the solids are disposed of with the spent sand blast grit. Just prior to the outfall, an eight-foot deep box is used to enhance settling. When the stormwater depth reaches a certain level, it is pumped into a centrifugal separator system designed to remove particulates.

The marine railway is no longer in use. In previous years stormwater discharged through two outfalls, 004 and 005. Outfall 004 has been eliminated. The drainage that used to discharge through Outfall 004 is now discharged through Outfall 005. Outfall 005 discharges stormwater runoff from all of the paved areas at the facility to the Duwamish River.

FACILITY NAME: DUWAMISH SHIPYARD, Inc.

On average, Duwamish Shipyard uses 800 tons of sand blast grit annually. More than 65% of the ships hauled out require partial or complete hull sand blasting, accounting for 80% of the grit used. About 10% is used in the sand blast shed on shore. The remaining 10% is used in ship holds and ship superstructures. Spent grit is recovered manually from the drydocks and railway prior to launching vessels. A bobcat is used to remove grit from the floor of the graving dock. Spent grit is stored in a covered storage area prior to being hauled to Lafarge Cement for reuse in the manufacture of cement.

About 30% of the vessels hauled out require pressure washing. Duwamish Shipyard collects the wash water from the point of origin and then pumps the water into a containment tank. The wash water is pretreated with a Delta Pollution Control flocculation system and discharged to the sanitary sewer. Pressure wash wastewater discharge to Duwamish River is prohibited.

In addition to pressure wash wastewater and stormwater, another type of shipyard discharge is drydock flood water. Drydock flood water is discharged when work is completed on a vessel and the drydock is flooded in order to float the vessel back into the river. Materials that may have accumulated on the floor of the drydock, such as spent abrasive grit, oil, paints, and solvents, are potential pollution sources to the receiving water. Best Management Practices (BMPs) must be used prior to flooding to prevent contamination of the receiving water.

#### PERMIT STATUS

The previous permit for this facility was issued on January 5, 1996, and modified on January 4, 1999, to remove the marine railway. The previous permit placed effluent limitations on:

Pressure Wash Wastewater		
All discharges to Duwamish River are prohibited.		
Drydock Discharges: Outfalls 001 and 002		
Parameter	Monthly Average	Daily Maximum
Oil and Grease	10 mg/L	15 mg/L
Turbidity	---	10 NTU above background
pH	Within a range of 6.0 to 9.0 standard units	
Copper		To be determined
Lead		To be determined
Zinc		To be determined
Graving Dock Discharges: Outfalls 003 and 004		
Parameter	Monthly Average	Daily Maximum
Oil and Grease	10 mg/L	15 mg/L
Turbidity	---	10 NTU above background
pH	Within a range of 6.0 to 8.0 standard units	
Copper		To be determined
Lead		To be determined
Zinc		To be determined

Stormwater Discharge: Outfall 005		
Parameter	Monthly Average	Daily Maximum
Oil and Grease	10 mg/L	15 mg/L
Turbidity	---	10 NTU above background
pH	Within a range of 6.0 to 9.0 standard units	
Total Suspended Solids		108 mg/L
Copper		To be determined
Lead		To be determined
Zinc		To be determined

Bilge and ballast water discharges could not exceed an oil and grease concentration of 10 mg/L and could not cause any visible sheen in the receiving waters. Bilge and ballast water could not be discharged to state waters if solvents, detergents, or other known or suspected additives or contaminants have been added, unless a state water quality variance or modification has been granted specific to that instance.

Oily bilge waters from machinery or pump room spaces were prohibited from discharge to state waters.

An application for permit renewal was submitted to the Department on July 3, 2000, and accepted by the Department on December 29, 2000.

#### *SUMMARY OF COMPLIANCE WITH THE PREVIOUS PERMIT*

The facility last received an inspection on July 20, 2001.

Duwamish Shipyard has violated the 10 NTU over background limit and the total suspended solids limit for Outfall 5 stormwater discharges. Outfall 5 stormwater discharges also violated the copper and zinc marine water quality limits in the Duwamish River. Outfall 3 discharging graving dock pump out water violated the copper marine water quality standards and violated the zinc standard on two occasions.

#### *WASTEWATER CHARACTERIZATION*

The proposed wastewater discharge is characterized for the following regulated parameters:

**Table 1: Wastewater Characterization**

Outfall	Copper µg/l	Lead µg/l	Zinc µg/l	Turbidity NTU
005 Stormwater	380	21	460	5.2
003 Graving Dock	193	3.5	57	1.4
Acute Marine Criteria	4.8	210	90	5.0

Average of samples June 1999 to July 2002

### Hydroblast Wastewater

Measurements at other shipyards and in a 1993 METRO study found hydroblast wastewater well above acute and chronic water quality criteria.

## **PROPOSED PERMIT LIMITATIONS**

Federal and State regulations require that effluent limitations set forth in an NPDES permit must be either technology- or water quality-based. Technology-based limitations are based upon the treatment methods available to treat specific pollutants. Technology-based limitations are set by regulation or developed on a case-by-case basis (40 CFR 125.3, and Chapter 173-220 WAC). Water quality-based limitations are based upon compliance with the Surface Water Quality Standards (Chapter 173-201A WAC), Ground Water Standards (Chapter 173-200 WAC), Sediment Quality Standards (Chapter 173-204 WAC), or the National Toxics Rule (Federal Register, Volume 57, No. 246, Tuesday, December 22, 1992). The more stringent of these two limits must be chosen for each of the parameters of concern. Each of these types of limits is described in more detail below.

The limits in this permit are based in part on information received in the application. The effluent constituents in the application were evaluated on a technology- and water quality-basis. The limits necessary to meet the rules and regulations of the State of Washington were determined and included in this permit. The Department does not develop effluent limits for all pollutants that may be reported on the application as present in the effluent. Some pollutants are not treatable at the concentrations reported, are not controllable at the source, are not listed in regulation, and do not have a reasonable potential to cause a water quality violation. Effluent limits are not always developed for pollutants that may be in the discharge but not reported as present in the application. In those circumstances, the permit does not authorize discharge of the non-reported pollutants. Effluent discharge conditions may change from the conditions reported in the permit application. If significant changes occur in any constituent, as described in 40 CFR 122.42(a), the Permittee is required to notify the Department of Ecology. The Permittee may be in violation of the permit until the permit is modified to reflect additional discharge of pollutants.

### **TECHNOLOGY-BASED EFFLUENT LIMITATIONS**

Hydroblast wastewater collection, treatment and recycle, evaporation or hauling to a sanitary sewerage system is determined to be the technology based limitation cited in Chapter 173-220 WAC as all known, available, and reasonable methods of treatment (AKART) . All process water discharges directly to the Duwamish River are prohibited.

Duwamish Shipyard will be required to continue to follow and improve as necessary Best Management Practices (BMPs). The drydock and graving dock will be cleaned to remove spent blasting abrasives and other solid wastes including paint chips, scrap metal, wood, plastic, paper and welding rods. Prior to undocking, the drydocks will be returned to a clean condition using dry cleanup methods (i.e., brooms, vacuums...etc.). The minimum amount of water flushing necessary to return the graving dock and drydocks to a clean condition may be used as a final cleanup step as long as the wastewater is not directly discharged to the Duwamish River. No change in turbidity between drydock flood waters and the ambient water will be allowed. Also no visible sheen will be allowed. Photographs will be taken and maintained in a logbook to demonstrate the condition of the drydock floors prior to launching a vessel.

Waters of the state are especially vulnerable from painting and hull preparation directly over water. Over water work with tarping does not have the benefit of collection and discharge to the sanitary sewer or treatment to the surface water criteria as is proposed at Duwamish Shipyard for upland or drydock repair. Attaching tarps to floats is more difficult than from piers and the instability, exposure and size of floats increases the risk of spills. BMP's to minimize discharges to the Duwamish River are required.

EPA measured a high concentration of oil and grease in flood water discharges. At Lake Union Drydock, a similar facility, only three exceedences above the detection limit, reported by Lake Union Drydock as 5 mg/L for oil and grease, occurred over the five-year permit cycle from Drydock 5. Five exceedences were reported from Drydock 6 and only one exceedance was reported from Drydock 7. All these occurred in the first two years of the permit cycle. The other 113 reported measurements were less than 5 mg/L. This means 93 percent of all measurements from all drydocks were less than 5 mg/L. The distribution of the data is neither normally nor log-normally distributed but is a flat distribution at less than 5 mg/L. This prevents the common method of determining technology-based effluent limits.

However, unquestionably if 5 mg/L has not been exceeded in the last three years of the permit cycle, then it is an achievable discharge level at Duwamish Shipyard, a similar facility. This level of control has also been achieved for drydock flood waters at Pacific Fishermen, Dakota Creek, FOSS, MARCO, and Northlake Shipyards. Duwamish Shipyard has consistently achieved control of oil and grease discharges to 5 mg/l or non-detect. Based on this achieved level of control and the best professional judgment of the Department an oil and grease effluent limitation of 5 mg/L is AKART for the flood water discharges from Duwamish Shipyard drydocks.

To minimize oil and grease discharges, the Department will establish oil and grease effluent limitation of 5 mg/L for stormwater from the upland yard. This level of control is AKART and has been achieved at Duwamish Shipyard and similar shipyards.

Hauling off-site or discharging to the sanitary sewer wastewater from cooking, dish washing, and showers is determined to be AKART.

Recycling of solvents on-site or off-site disposal is AKART. Zero discharge from maintenance shops is determined to be AKART.

Discharge of bilge and ballast water from ships on drydocks by hauling off-site for treatment or discharge to the sanitary sewerage system subsequent to approval is determined to be AKART.

Performance-based interim effluent limitations for Outfalls 003 and 005 are derived from formulas in Appendix E of the EPA Technical Support Document, March 1991, calculated based on the observed data from June 1999 to July 2002.



**Table 2: Interim Effluent Limitations**

	<b>Copper µg/L</b>	<b>Lead µg/L</b>	<b>Zinc µg/L</b>	<b>Turbidity NTU</b>
Stormwater Outfall 5	2385	143	3412	9.9
Graving Dock Outfall 3	1060	No Potential	159	3

The Urban Stormwater BMP Performance Manual guidance manual page 68 recommends turbidity as a surrogate for TSS. The Department concurs. The lighter more difficult to control solids measured as turbidity determined by light diffraction are more difficult to control than the solids measured as total suspended solid determined by mass. If turbidity is controlled, then TSS will be controlled. The elimination of the TSS limit and monitoring will not increase pollutant discharges. Past monitoring has demonstrated pH from shipyards is not a pollutant of concern.

#### *SURFACE WATER QUALITY-BASED EFFLUENT LIMITATIONS*

In order to protect existing water quality and preserve the designated beneficial uses of Washington's surface waters, WAC 173-201A-060 states that waste discharge permits shall be conditioned such that the discharge will meet established Surface Water Quality Standards. The Washington State Surface Water Quality Standards (Chapter 173-201A WAC) is a state regulation designed to protect the beneficial uses of the surface waters of the state. Surface water quality-based effluent limitations may be based on an individual waste load allocation (WLA) or on a WLA developed during a basin wide total maximum daily loading study (TMDL).

#### NUMERICAL CRITERIA FOR THE PROTECTION OF AQUATIC LIFE

"Numerical" water quality criteria are numerical values set forth in the State of Washington's Water Quality Standards for Surface Waters (Chapter 173-201A WAC). They specify the levels of pollutants allowed in a receiving water while remaining protective of aquatic life. Numerical criteria set forth in the water quality standards are used along with chemical and physical data for the wastewater and receiving water to derive the effluent limits in the discharge permit. When surface water quality-based limits are more stringent or potentially more stringent than technology-based limitations, they must be used in a permit.

#### NUMERICAL CRITERIA FOR THE PROTECTION OF HUMAN HEALTH

The U.S. EPA has promulgated 91 numeric water quality criteria for the protection of human health that are applicable to Washington State (EPA 1992). These criteria are designed to protect humans from cancer and other diseases and are primarily applicable to fish and shellfish consumption and drinking water from surface waters.

#### NARRATIVE CRITERIA

In addition to numerical criteria, "narrative" water quality criteria (WAC 173-201A-030) limit toxic, radioactive, or deleterious material concentrations below those which have the potential to adversely affect characteristic water uses, cause acute or chronic toxicity to biota, impair aesthetic values, or adversely affect human health. Narrative criteria protect the specific beneficial uses of all fresh (WAC 173-201A-130) and marine (WAC 173-201A-140) waters in the state of Washington.

#### ANTIDEGRADATION

The State of Washington's Antidegradation Policy requires that discharges into a receiving water shall not further degrade the existing water quality of the water body. In cases where the natural conditions of a receiving water are of lower quality than the criteria assigned, the natural conditions shall constitute the water quality criteria. Similarly, when the natural conditions of a receiving water are of higher quality than the criteria assigned, the natural conditions shall be protected. More information on the Washington State Antidegradation Policy can be obtained by referring to WAC 173-201A-070.

The Department has reviewed existing records and is unable to determine if ambient water quality is either higher or lower than the designated classification criteria given in Chapter 173-201A WAC; therefore, the Department will use the designated classification criteria for this water body in the proposed permit. The discharges authorized by this proposed permit should not cause a loss of beneficial uses.

#### CRITICAL CONDITIONS

Surface water quality-based limits are derived for the water body's critical condition, which represents the receiving water and waste discharge condition with the highest potential for adverse impact on the aquatic biota, human health, and existing or characteristic water body uses.

#### MIXING ZONES

The water quality standards allow the Department of Ecology to authorize mixing zones around a point of discharge in establishing surface water quality-based effluent limits. Both "acute" and "chronic" mixing zones may be authorized for pollutants that can have a toxic effect on the aquatic environment near the point of discharge. The concentration of pollutants at the boundary of these mixing zones may not exceed the numerical criteria for that type of zone. Mixing zones can only be authorized for discharges that are receiving all known, available, and reasonable methods of prevention, control, and treatment (AKART) and in accordance with other mixing zone requirements of WAC 173-201A-100.

The National Toxics Rule (EPA, 1992) allows the chronic mixing zone to be used to meet human health criteria. A mixing zone is not granted in this reissuance.

#### DESCRIPTION OF THE RECEIVING WATER

The facility discharges to the Duwamish River in the vicinity of the outfall. The previous permit listed this as Class B freshwater. However, WAC 173-201A-060(2) is used to determine classifications based on salinity in brackish waters of estuaries, where the fresh and marine water quality criteria differ within the same classification. The criteria shall be applied on the basis of vertically-averaged salinity. The freshwater criteria shall be applied at any point where ninety-five percent of the vertically-average daily maximum salinity values are less than or equal to one part per thousand. Marine criteria shall apply at all other locations, except for dissolved oxygen and fecal coliform neither of which is discharged from Duwamish.

Appendix C includes a letter from Randy Shuman to Eric Paul of Seattle Iron and Metal correlating conductivity to salinity around the Michigan Street Bridge. The conclusion is the majority of surface samples and the deep samples are all greater than one part per thousand and therefore the Duwamish River at this point should be considered marine waters. The classification of receiving waters for Duwamish Shipyard is, therefore, changed from Class B freshwater to Class A marine water consistent with Elliott Bay. Other nearby point source outfalls include Seattle Iron and Metal and boatyards, cement manufacturing, and concrete batching. Significant nearby nonpoint sources of pollutants include CSOs. Characteristic uses include the following:

water supply (domestic, industrial, agricultural); stock watering; fish migration; fish rearing, spawning and harvesting; wildlife habitat; primary contact recreation; sport fishing; boating and aesthetic enjoyment; commerce and navigation.

Water quality of this class shall meet or exceed the requirements for all or substantially all uses.

#### SURFACE WATER QUALITY CRITERIA

Applicable criteria are defined in Chapter 173-201A WAC for aquatic biota. In addition, U.S. EPA has promulgated human health criteria for toxic pollutants (EPA, 1992). Criteria for this discharge are summarized below:

Turbidity	less than 5 NTU above background
Toxics	No toxics in toxic amounts (see Appendix C for numeric criteria for toxics of concern for this discharge)

Federal criterion for oil and grease is waters are to remain essentially free of oil and grease of petroleum origin.

The 1994 Section 305(B) report assessing statewide water quality described the Duwamish River as water quality impaired for secondary contact recreation and wildlife habitat, due to ammonia, pH, dissolved oxygen/organic enrichment, thermal modifications, and fecal coliform/other pathogen indicators. These pollutants are attributed to combined sewer overflow events, urban runoff and storm sewers, other sources (unspecified), and natural sources.

The Duwamish River is also included on the 1994 EPA 303(d) list for exceeding dissolved oxygen and fecal coliform water quality standards. The 303(d) list also reports that sediments exceed the marine sediment quality standards for copper, lead, zinc, polycyclic aromatic hydrocarbons (PAHs), polychlorinated biphenyls (PCBs), and sediment bioassay.

Although none of the reports specifically list ship repair activities as a source of water body impairment, shipyards are a potential source of metals contamination. Copper, lead, and zinc are common constituents of paints, primers, sand blast agents, and washwater. Solvents and petroleum-based products are also commonly used at shipyards and improper handling of these materials could result in spills to waters of the state.

## CONSIDERATION OF SURFACE WATER QUALITY-BASED LIMITS FOR NUMERIC CRITERIA

Pollutants in an effluent may affect the aquatic environment near the point of discharge (near-field) or at a considerable distance from the point of discharge (far-field). Toxic pollutants, for example, are near-field pollutants—their adverse effects diminish rapidly with mixing in the receiving water. Conversely, a pollutant such as BOD is a far-field pollutant whose adverse effect occurs away from the discharge even after dilution has occurred. Thus, the method of calculating surface water quality-based effluent limits varies with the point at which the pollutant has its maximum effect.

The derivation of surface water quality-based limits also takes into account the variability of the pollutant concentrations in both the effluent and the receiving water. A mixing zone is not granted in this reissuance.

Oil and Grease—The federal criterion for oil and grease in the *Quality Criteria for Water, 1986*, is that surface waters shall be virtually free from floating oils of petroleum. Bioaccumulation of petroleum products presents two especially important public health problems: (1) the tainting of edible, aquatic species, and (2) the possibility of edible marine organisms incorporating the high boiling, carcinogenic polycyclic aromatics in their tissues. Oils of any kind can cause drowning of water fowl because of loss of buoyancy, exposure because of loss of insulating capacity of feathers and starvation and vulnerability to predators because of lack of mobility, lethal effects on fish by coating epithelial surfaces of gills, thus preventing respiration, asphyxiation of benthic life forms when floating masses become engaged with surface debris and settle on the bottom and adverse aesthetic effects of fouled shorelines and beaches. Oil pollutants may also be incorporated into sediments. There is evidence that once this occurs in the sediments below the aerobic surface layer, petroleum can remain unchanged and toxic for long periods, since its rate of bacterial degradation is slow. The Department determines 5 mg/L oil and grease limit, no visible oil sheen, discoloration, or turbidity meets this requirement. Monitoring will be by grab sample, visual observation, and logging and noncompliance notification.

Turbidity—Due to the potential fluctuations in turbidity of the receiving water and the effluent, turbidity monitoring is required to assess compliance with the water quality criteria for turbidity. The criteria for turbidity allows no more than a 5 NTU increase over background turbidity. The Duwamish Shipyard has achieved a discharge of 10 NTU. A performance-based limit of 10 NTU will meet the surface water quality criteria.

Toxic Pollutants—Federal regulations (40 CFR 122.44) require NPDES permits to contain effluent limits for toxic chemicals in an effluent whenever there is a reasonable potential for those chemicals to exceed the surface water quality criteria. This process occurs concurrently with the derivation of technology-based effluent limits. Facilities with technology-based effluent limits defined in regulation are not exempted from meeting the water quality standards for surface waters or from having surface water quality-based effluent limits.

The following toxics were determined to be present in the discharge: copper, lead, and zinc.

The determination of the reasonable potential for copper, lead, and zinc from stormwater Outfall 5 and copper and zinc for graving dock pump out water Outfall 3 to exceed the water quality criteria was evaluated with procedures given in EPA, 1991 (Appendix C) at the critical condition. Even with virtually no background, Duwamish Shipyard stormwater and graving dock pump out water discharges violate criteria.

Effluent limits were derived for copper, lead, zinc, and turbidity which were determined to have a reasonable potential to cause a violation of the water quality standards. Effluent limits were calculated using methods from EPA, 1991, as shown in Appendix D.

The resultant effluent limits are as follows:

<b>INTERIM EFFLUENT LIMITATIONS: OUTFALL 005 TO THE DUWAMISH RIVER</b>	
<b>Parameter<sup>1</sup></b>	<b>Maximum Daily<sup>a</sup></b>
Oil and Grease	5 mg/L
Oil and Grease	No Visible Sheen
Turbidity	10 NTU
Turbidity	5 NTU above background
Total Recoverable Copper	2385 µg/L
Total Recoverable Lead	143 µg/L
Total Recoverable Zinc	3412 µg/L
<sup>a</sup> The maximum daily effluent limitation is defined as the highest allowable daily discharge.	

<b>INTERIM EFFLUENT LIMITATIONS: OUTFALL 003 TO THE DUWAMISH RIVER</b>	
<b>Parameter<sup>1</sup></b>	<b>Maximum Daily<sup>a</sup></b>
Oil and Grease	5 mg/L
Oil and Grease	No Visible Sheen
Turbidity	5 NTU
Total Recoverable Copper	1060 µg/L
Total Recoverable Zinc	159 µg/L
<sup>a</sup> The maximum daily effluent limitation is defined as the highest allowable daily discharge.	

The proposed permit contains a compliance schedule for meeting the water quality-based limits for copper, lead, and zinc. Prior to authorizing this compliance schedule, the Department required the Permittee to evaluate the possibility of complying with the limitations by changes other than construction.

The proposed permit contains interim limits for copper, lead, and zinc as required by Chapter 173-201A-170(4)(b)WAC. The limits are based on existing demonstrated performance. Water quality criteria for metals in Chapter 173-201A WAC are based on the dissolved fraction of the metal.

The Permittee may provide data clearly demonstrating the seasonal partitioning of the dissolved metal in the ambient water in relation to an effluent discharge. Metals criteria may be adjusted on a site-specific basis when data is available clearly demonstrating the seasonal partitioning in the ambient water in relation to an effluent discharge.

Metals criteria may also be adjusted using the water effects ratio approach established by USEPA, as generally guided by the procedures in USEPA Water Quality Standards Handbook, December 1983, as supplemented or replaced.

#### WHOLE EFFLUENT TOXICITY

The water quality standards for surface waters require that the effluent not cause toxic effects in the receiving waters. Many toxic pollutants cannot be detected by commonly available detection methods. However, toxicity can be measured directly by exposing living organisms to the wastewater in laboratory tests and measuring the response of the organisms. Toxicity tests measure the aggregate toxicity of the whole effluent, and therefore this approach is called whole effluent toxicity (WET) testing. Some WET tests measure acute toxicity and other WET tests measure chronic toxicity.

In accordance with WAC 173-205-040, the Permittee's effluent has been determined to have the potential to contain toxic chemicals. The proposed permit would ordinarily contain requirements for whole effluent toxicity testing as authorized by RCW 90.48.520 and 40 CFR 122.44 and in accordance with procedures in Chapter 173-205 WAC. However, the Permittee is improving pollution control in order to meet other regulatory requirements. The results of an effluent characterization for toxicity would not be accurate until after the improvements have been completed.

WAC 173-205-030(4) allows the Department to delay effluent characterization for WET for existing facilities that are under a compliance schedule in a permit to implement technology-based controls or to achieve compliance with surface water quality-based effluent limits. Duwamish Shipyard's preferred alternative is discharge to the sanitary sewer system. If discharge continues to the Duwamish River, WET testing may be required by order of permit modification.

#### HUMAN HEALTH

Washington's water quality standards now include 91 numeric health-based criteria that must be considered in NPDES permits. These criteria were promulgated for the state by the U.S. EPA in its National Toxics Rule (Federal Register, Volume 57, No. 246, Tuesday, December 22, 1992).

The Department has determined that the applicant's discharge is unlikely to contain chemicals regulated for human health.

#### SEDIMENT QUALITY

The Department has promulgated aquatic sediment standards (Chapter 173-204 WAC) to protect aquatic biota and human health. These standards state that the Department may require Permittees to evaluate the potential for the discharge to cause a violation of applicable standards (WAC 173-204-400).

### 1996 Contaminated Sediment Site List (CSSL)

A February 1994 memorandum<sup>1</sup> details an evaluation of the chemical and bioassay data for cleanup site identification (see fax). The following was found during that evaluation:

- *The chemistry indicates that all three stations are contaminated with metals, PAHs, phthalates, and organotins commonly associated with shipyards.*
- *The two highest stations failed the biological CSL and an adjacent station showed results statistically indistinguishable from a [biological] CSL failure.*
- *[Recommend] that the Duwamish Shipyard be designated a station cluster of potential concern and included in the site list development for the Duwamish River/Elliott Bay.*
- *[Another option includes] designating them as a follow up area with required additional sampling under the NPDES program.*

The 1996 CSSL concluded that *sediment contamination at the Duwamish Shipyard was identified during recent NPDES monitoring, and includes contamination by metals and phthalates. No cleanup action is occurring at this time.* Figure 1 shows the discharge location per the draft NPDES permit, SEDQUAL survey DUSHIP93 stations, identifies chemical exceedances at each station, surrounding SEDQUAL stations, and the CSSL areas. DR36 is the CSSL area for the Duwamish Shipyard.

### 1998 303(d) List

A review of a hard copy of Washington's 1998 Clean Water Act Section 303(d) list shows that the Duwamish Waterway and River is listed for sediment bioassay, benzo(a)pyrene, indeno(1,2,3-c,d)pyrene, lead, naphthalene, PAHs, pyrene, silver, and 1,4-dichlorobenzene. I have not found a GIS coverage that shows the exact location of the listed grids.

The 2002 303(d) list is currently under development.

### Conclusion

In the ~10 years since 1993, baseline sediment sampling found SQS and CSL chemical and bioassay exceedances in the vicinity of the Duwamish Shipyard:

- Surrounding stations have shown SQS and CSL exceedances for the same chemicals;
- Nearby areas have been identified as cleanup sites;
- The 1998 303(d) list contains listings for the same chemicals that exceeded in 1993;
- The Duwamish Shipyard is on the *Sediment Management Standards* Site list; and
- In the last year or so, the Duwamish River was designated as an EPA Superfund Site.

The Department has determined that this discharge has the potential to cause a violation of the sediment quality standards because of copper, lead, and zinc. A condition has been placed in the proposed permit which requires the Permittee to demonstrate that either the point of discharge is not an area of deposition or, if the point of discharge is a depositional area, that there is not an accumulation of toxics in the sediments. Duwamish Shipyards preferred alternative is discharge of all industrial stormwater to the sanitary sewer eliminating further contamination of sediments.

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<sup>1</sup> Michelsen, 1994. *Duwamish Shipyard NPDES Sediments Monitoring Report*. Teresa Michelsen to Rachel Friedman-Thomas, cc'd Deb North, Russ McMillan. February 25, 1994.

### GROUND WATER QUALITY LIMITATIONS

The Department has promulgated Ground Water Quality Standards (Chapter 173-200 WAC) to protect beneficial uses of ground water. Permits issued by the Department shall be conditioned in such a manner so as not to allow violations of those standards (WAC 173-200-100).

This Permittee has no discharge to ground and therefore no limitations are required based on potential effects to ground water.

### COMPARISON OF EFFLUENT LIMITS WITH THE EXISTING PERMIT ISSUED January 5, 1996

	Existing Limits	Proposed Limits
<b>Pressure Wash Wastewater</b>	No Direct Discharge	No Direct Discharge
<b>Sewage and Grey Water</b>	No Direct Discharge	No Direct Discharge
<b>Stormwater</b>		
Oil and grease	10 mg/L Daily Maximum 15 mg/L Monthly Average	5 mg/L Daily Maximum
Turbidity	10 NTU above background	10 NTU discharge limit and 5 NTU above background
pH	Within a range of 6.0 to 9.0	None
TSS	108 mg/L	None
Total Recoverable Copper	None	Interim Limit 2385 µg/L Compliance with criteria by November 1, 2004
Total Recoverable Lead	None	Interim Limit 143 µg/L Compliance with criteria by November 1, 2004
Total Recoverable Zinc	None	Interim Limit 3412 µg/L Compliance with criteria by November 1, 2004
<b>Graving Dock Pump Out Water</b>		
Oil and Grease	10 mg/L Daily Maximum 15 mg/L Monthly Average	5 mg/L No Visible Sheen
Turbidity	10 NTU above background	5 NTU
Total Recoverable Copper	None	Interim Limit 1060 µg/L Compliance with criteria by November 1, 2004
Total Recoverable Zinc	None	Interim Limit 159 µg/L Compliance with criteria by November 1, 2004
pH	Within a range of 6.0 to 9.0	None
<b>Drydock Receiving Water</b>		
Oil and Grease	10 mg/L Daily Maximum 15 mg/L Monthly Average	5 mg/L No Visible Sheen
pH	Within a range of 6.0 to 9.0	None



The lighter more-difficult-to-control solids measured as turbidity determined as light diffraction are more difficult to control than the solids measured as total suspended solid determined by mass. If turbidity is controlled, then TSS will be controlled. The elimination of the TSS limit and monitoring will not increase pollutant discharges. Past monitoring has demonstrated pH from shipyards is not a pollutant of concern.

## **MONITORING REQUIREMENTS**

Monitoring, recording, and reporting are required (WAC 173-220-210 and 40 CFR 122.41) to verify that the treatment process is functioning correctly and the effluent limitations are being achieved.

The monitoring schedule is detailed in the proposed permit under Condition S.2. Specified monitoring frequencies take into account the quantity and variability of the discharge, the treatment method, past compliance, significance of pollutants, and cost of monitoring.

Drydock flood water monitoring is eliminated except for oil and grease. Flood water discharges are indistinguishable and are masked by receiving source water.

Stormwater monitoring for metals, oil and grease, and turbidity is being required to further characterize the effluent. These pollutants could have a significant impact on the quality of the surface water.

This permit requires the Permittee to monitor the stormwater outfalls on a twice-per-month schedule consistent with MARCO, Hansen, Pacific Fishermen, and Fishing Vessel Owners Marine Ways, Puglia Engineering, and TODD Pacific.

A visual observation and log with photographs shall be maintained of each lowering of the drydocks.

### **LAB ACCREDITATION**

With the exception of certain parameters, the permit requires all monitoring data to be prepared by a laboratory registered or accredited under the provisions of Chapter 173-50 WAC, *Accreditation of Environmental Laboratories*.

## **OTHER PERMIT CONDITIONS**

### **REPORTING AND RECORDKEEPING**

The conditions of S3 are based on the authority to specify any appropriate reporting and recordkeeping requirements to prevent and control waste discharges (WAC 173-220-210).

### *NONROUTINE AND UNANTICIPATED DISCHARGES*

Occasionally, this facility may generate wastewater which is not characterized in their permit application, because it is not a routine discharge and was not anticipated at the time of application. These typically are waters used to pressure-test storage tanks or fire water systems or leaks from drinking water systems. These are typically clean waste waters but may be contaminated with pollutants. The permit contains an authorization for nonroutine and unanticipated discharges. The permit requires a characterization of these waste waters for pollutants and examination of the opportunities for reuse. Depending on the nature and extent of pollutants in this wastewater and opportunities for reuse, Ecology may authorize a direct discharge via the process wastewater outfall or through a stormwater outfall for clean water, require the wastewater to be placed through the facilities wastewater treatment process, or require the water to be reused.

### *SPILL PLAN*

The Department has determined that the Permittee stores a quantity of chemicals that have the potential to cause water pollution if accidentally released. The Department has the authority to require the Permittee to develop best management plans to prevent this accidental release under Section 402(a)(1) of the Federal Water Pollution Control Act (FWPCA) and RCW 90.48.080.

The Permittee has developed a plan for preventing the accidental release of pollutants to state waters and for minimizing damages if such a spill occurs. The proposed permit requires the Permittee to update this plan and submit it to the Department.

### *SOLID WASTE PLAN*

The Department has determined that the Permittee has a potential to cause pollution of the waters of the state from leachate of solid waste.

This proposed permit requires, under the authority of RCW 90.48.080, that the Permittee update the solid waste plan designed to prevent solid waste from causing pollution of the waters of the state. The plan must be submitted to the local permitting agency for approval, if necessary, and to the Department.

### *GENERAL CONDITIONS*

General Conditions are based directly on state and federal law and regulations and have been standardized for all individual industrial NPDES permits issued by the Department.

## PERMIT ISSUANCE PROCEDURES

### PERMIT MODIFICATIONS

The Department may modify this permit to impose numerical limitations, if necessary, to meet Water Quality Standards for Surface Waters, Sediment Quality Standards, or Water Quality Standards for Ground Waters, based on new information obtained from sources such as inspections, effluent monitoring, outfall studies, and effluent mixing studies.

The Department may also modify this permit as a result of new or amended state or federal regulations.

### RECOMMENDATION FOR PERMIT ISSUANCE

This proposed permit meets all statutory requirements for authorizing a wastewater discharge, including those limitations and conditions believed necessary to control toxics, protect human health, aquatic life, and the beneficial uses of waters of the state of Washington. The Department proposes that this proposed permit be issued for four (4) years. This is consistent with the Cedar Green Watershed permit cycle.

## REFERENCES FOR TEXT AND APPENDICES

Environmental Protection Agency (EPA)

- 1992. National Toxics Rule. Federal Register, V. 57, No. 246, Tuesday, December 22, 1992.
- 1991. Technical Support Document for Water Quality-based Toxics Control. EPA/505/2-90-001.
- 1988. Technical Guidance on Supplementary Stream Design Conditions for Steady State Modeling. USEPA Office of Water, Washington, D.C.
- 1985. Water Quality Assessment: A Screening Procedure for Toxic and Conventional Pollutants in Surface and Ground Water. EPA/600/6-85/002a.
- 1983. Water Quality Standards Handbook. USEPA Office of Water, Washington, D.C.

Tsivoglou, E.C., and J.R. Wallace.

- 1972. Characterization of Stream Reaeration Capacity. EPA-R3-72-012. (Cited in EPA 1985 op.cit.)

Washington State Department of Ecology.

- 1994. Permit Writer's Manual. Publication Number 92-109

Washington State Department of Ecology.

- Laws and Regulations (<http://www.ecy.wa.gov/laws-rules/index.html>)
- Permit and Wastewater Related Information  
(<http://www.ecy.wa.gov/programs/wq/wastewater/index.html>)

Wright, R.M., and A.J. McDonnell.

- 1979. In-stream Deoxygenation Rate Prediction. Journal Environmental Engineering Division, ASCE. 105(E2). (Cited in EPA 1985 op.cit.)

## APPENDIX A—PUBLIC INVOLVEMENT INFORMATION

The Department has tentatively determined to reissue a permit to the applicant listed on page one of this fact sheet. The permit contains conditions and effluent limitations which are described in the rest of this fact sheet.

Public Notice of Application (PNOA) was published on September 4, 2001, and September 11, 2001, in the *Seattle Times* to inform the public that an application had been submitted and to invite comment on the reissuance of this permit.

The Department published a Public Notice of Draft (PNOD) on March 3, 2003, in the *Seattle Times* to inform the public that a draft permit and fact sheet were available for review. Interested persons were invited to submit written comments regarding the draft permit. The draft permit, fact sheet, and related documents were available for inspection and copying between the hours of 8:00 a.m. and 5:00 p.m. weekdays, by appointment, at the regional office listed below. Written comments were mailed to:

Water Quality Permit Coordinator  
WA State Department of Ecology  
Northwest Regional Office  
3190 - 160<sup>th</sup> Avenue SE  
Bellevue, WA 98008-5452

Any interested party may comment on the draft permit or request a public hearing on this draft permit within the thirty (30)-day comment period to the address above. The request for a hearing shall indicate the interest of the party and reasons why the hearing is warranted. The Department will hold a hearing if it determines there is a significant public interest in the draft permit (WAC 173-220-090). Public notice regarding any hearing will be circulated at least thirty (30) days in advance of the hearing. People expressing an interest in this permit will be mailed an individual notice of hearing (WAC 173-220-100).

Comments should reference specific text followed by proposed modification or concern when possible. Comments may address technical issues, accuracy and completeness of information, the scope of the facility's proposed coverage, adequacy of environmental protection, permit conditions, or any other concern that would result from issuance of this permit.

The Department will consider all comments received within thirty (30) days from the date of public notice of draft indicated above, in formulating a final determination to issue, revise, or deny the permit. The Department's response to all significant comments is available upon request and will be mailed directly to people expressing an interest in this permit.

Further information may be obtained from the Department by telephone, (425) 649-7293, or by writing to the address listed above.

This permit and fact sheet were written by John Drabek.

## APPENDIX B—GLOSSARY

**Acute Toxicity**—The lethal effect of a compound on an organism that occurs in a short period of time, usually 48 to 96 hours.

**AKART**—An acronym for “all known, available, and reasonable methods of treatment.”

**Ambient Water Quality**—The existing environmental condition of the water in a receiving water body.

**Ammonia**—Ammonia is produced by the breakdown of nitrogenous materials in wastewater. Ammonia is toxic to aquatic organisms, exerts an oxygen demand, and contributes to eutrophication. It also increases the amount of chlorine needed to disinfect wastewater.

**Average Monthly Discharge Limitation**—The average of the measured values obtained over a calendar month's time.

**Best Management Practices (BMPs)**—Schedules of activities, prohibitions of practices, maintenance procedures, and other physical, structural and/or managerial practices to prevent or reduce the pollution of waters of the state. BMPs include treatment systems, operating procedures, and practices to control: plant site runoff, spillage or leaks, sludge or waste disposal, or drainage from raw material storage. BMPs may be further categorized as operational, source control, erosion and sediment control, and treatment BMPs.

**BOD<sub>5</sub>**—Determining the Biochemical Oxygen Demand of an effluent is an indirect way of measuring the quantity of organic material present in an effluent that is utilized by bacteria. The BOD<sub>5</sub> is used in modeling to measure the reduction of dissolved oxygen in a receiving water after effluent is discharged. Stress caused by reduced dissolved oxygen levels makes organisms less competitive and less able to sustain their species in the aquatic environment. Although BOD is not a specific compound, it is defined as a conventional pollutant under the federal Clean Water Act.

**Bypass**—The intentional diversion of waste streams from any portion of a treatment facility.

**Chlorine**—Chlorine is used to disinfect wastewaters of pathogens harmful to human health. It is also extremely toxic to aquatic life.

**Chronic Toxicity**—The effect of a compound on an organism over a relatively long time, often 1/10 of an organism's lifespan or more. Chronic toxicity can measure survival, reproduction or growth rates, or other parameters to measure the toxic effects of a compound or combination of compounds.

**Clean Water Act (CWA)**—The Federal Water Pollution Control Act enacted by Public Law 92-500, as amended by Public Laws 95-217, 95-576, 96-483, 97-117; USC 1251 et seq.

**Compliance Inspection - Without Sampling**—A site visit for the purpose of determining the compliance of a facility with the terms and conditions of its permit or with applicable statutes and regulations.

**Compliance Inspection - With Sampling**—A site visit to accomplish the purpose of a Compliance Inspection - Without Sampling and as a minimum, sampling and analysis for all parameters with limits in the permit to ascertain compliance with those limits; and, for municipal facilities, sampling of influent to ascertain compliance with the 85 percent removal requirement. Additional sampling may be conducted.

**Construction Activity**—Clearing, grading, excavation, and any other activity which disturbs the surface of the land. Such activities may include road building; construction of residential houses, office buildings, or industrial buildings; and demolition activity.

**Continuous Monitoring**—Uninterrupted, unless otherwise noted in the permit.

**Critical Condition**—The time during which the combination of receiving water and waste discharge conditions have the highest potential for causing toxicity in the receiving water environment. This situation usually occurs when the flow within a water body is low, thus, its ability to dilute effluent is reduced.

**Dilution Factor**—A measure of the amount of mixing of effluent and receiving water that occurs at the boundary of the mixing zone. Expressed as the inverse of the percent effluent fraction, e.g., a dilution factor of 10 means the effluent comprises 10% by volume and the receiving water 90%.

**Engineering Report**—A document which thoroughly examines the engineering and administrative aspects of a particular domestic or industrial wastewater facility. The report shall contain the appropriate information required in WAC 173-240-060 or 173-240-130.

**Fecal Coliform Bacteria**—Fecal coliform bacteria are used as indicators of pathogenic bacteria in the effluent that are harmful to humans. Pathogenic bacteria in wastewater discharges are controlled by disinfecting the wastewater. The presence of high numbers of fecal coliform bacteria in a water body can indicate the recent release of untreated wastewater and/or the presence of animal feces.

**Grab Sample**—A single sample or measurement taken at a specific time or over a short period of time as is feasible.

**Industrial Wastewater**—Water or liquid-carried waste from industrial or commercial processes, as distinct from domestic wastewater. These wastes may result from any process or activity of industry, manufacture, trade or business; from the development of any natural resource; or from animal operations such as feed lots, poultry houses, or dairies. The term includes contaminated storm water and, also, leachate from solid waste facilities.

**Major Facility**—A facility discharging to surface water with an EPA rating score of >80 points based on such factors as flow volume, toxic pollutant potential, and public health impact.

**Maximum Daily Discharge Limitation**—The highest allowable daily discharge of a pollutant measured during a calendar day or any 24-hour period that reasonably represents the calendar day for purposes of sampling. The daily discharge is calculated as the average measurement of the pollutant over the day.

**Method Detection Level (MDL)**—The minimum concentration of a substance that can be measured and reported with 99% confidence that the analyte concentration is above zero and is determined from analysis of a sample in a given matrix containing the analyte.

**Mixing Zone**—An area that surrounds an effluent discharge within which water quality criteria may be exceeded. The area of the authorized mixing zone is specified in a facility's permit and follows procedures outlined in state regulations (Chapter 173-201A WAC).

**National Pollutant Discharge Elimination System (NPDES)**—The NPDES (Section 402 of the Clean Water Act) is the federal wastewater permitting system for discharges to navigable waters of the United States. Many states, including the state of Washington, have been delegated the authority to issue these permits. NPDES permits issued by Washington State permit writers are joint NPDES/state permits issued under both state and federal laws.

**pH**—The pH of a liquid measures its acidity or alkalinity. A pH of 7 is defined as neutral, and large variations above or below this value are considered harmful to most aquatic life.

**Quantitation Level (QL)**—A calculated value five times the MDL (method detection level).

**Responsible Corporate Officer**—A president, secretary, treasurer, or vice-president of the corporation in charge of a principal business function, or any other person who performs similar policy- or decision-making functions for the corporation, or the manager of one or more manufacturing, production, or operating facilities employing more than 250 persons or have gross annual sales or expenditures exceeding \$25 million (in second quarter 1980 dollars), if authority to sign documents has been assigned or delegated to the manager in accordance with corporate procedures (40 CFR 122.22).

**Technology-based Effluent Limit**—A permit limit that is based on the ability of a treatment method to reduce the pollutant.

**Total Suspended Solids (TSS)**—Total suspended solids is the particulate material in an effluent. Large quantities of TSS discharged to a receiving water may result in solids accumulation. Apart from any toxic effects attributable to substances leached out by water, suspended solids may kill fish, shellfish, and other aquatic organisms by causing abrasive injuries and by clogging the gills and respiratory passages of various aquatic fauna. Indirectly, suspended solids can screen out light and can promote and maintain the development of noxious conditions through oxygen depletion.

**State Waters**—Lakes, rivers, ponds, streams, inland waters, underground waters, salt waters, and all other surface waters and watercourses within the jurisdiction of the State of Washington.

**Stormwater**—That portion of precipitation that does not naturally percolate into the ground or evaporate, but flows via overland flow, interflow, pipes, and other features of a storm water drainage system into a defined surface water body, or a constructed infiltration facility.

**Upset**—An exceptional incident in which there is unintentional and temporary noncompliance with technology-based permit effluent limitations because of factors beyond the reasonable control of the Permittee. An upset does not include noncompliance to the extent caused by operational error, improperly designed treatment facilities, lack of preventative maintenance, or careless or improper operation.

**Water Quality-based Effluent Limit**—A limit on the concentration of an effluent parameter that is intended to prevent the concentration of that parameter from exceeding its water quality criterion after it is discharged into a receiving water.

## **APPENDIX C—FIGURES**



## **APPENDIX D—TECHNICAL CALCULATIONS**

Several of the Excel® spreadsheet tools used to evaluate a discharger's ability to meet Washington State water quality standards can be found on the Department's homepage at <http://www.ecy.wa.gov>.

**APPENDIX E—RESPONSE TO COMMENTS**